

REMARKS

Reconsideration of this application, in view of the following remarks, is respectfully requested.

Claims 1-53 were originally presented for consideration in this application. Claims 10, 11 and 47 have been canceled without prejudice or disclaimer. Accordingly, claims 1-9, 12-46 and 48-53 are currently pending in this application.

The Office Action incorrectly lists claims 1-53 as pending in the application.

The following rejection was set forth in the Office Action:

Claims 1, 2, 4, 6-9, 29, 30, 37-41, 44, 46, 49 52 and 53 stand rejected under 35 USC §103 as being unpatentable over U.S. Patent No. 6,843,490 (Raidel) in view of U.S. Patent No. 4,858,949 (Wallace), and further in view of U.S. Patent No. 6,893,733 (Obeshaw).

Regarding the obviousness rejections, the Office Action alleges that it would have been obvious at the time the invention was made to combine the teachings of three references (Raidel, Wallace and Obeshaw) and produce the invention defined by the claims of the present application. The applicant respectfully disagrees.

The rejections do not satisfy the requirements set forth in the seminal U.S. Supreme Court case of *Graham v. John Deere* for evaluating whether an invention would have been obvious to a person of ordinary skill in the art at the time the invention was made. These requirements include determining the level of skill of the person having ordinary skill in the art, the scope and content of the prior art, and the differences between the claimed invention and the prior art. Additional considerations may include factors such as failure of others to solve the relevant problem, long felt but

unsatisfied need, skepticism of others, teaching away in the prior art, unexpected results, copying, the pace of innovation in the art, commercial success, industry accolades, etc.

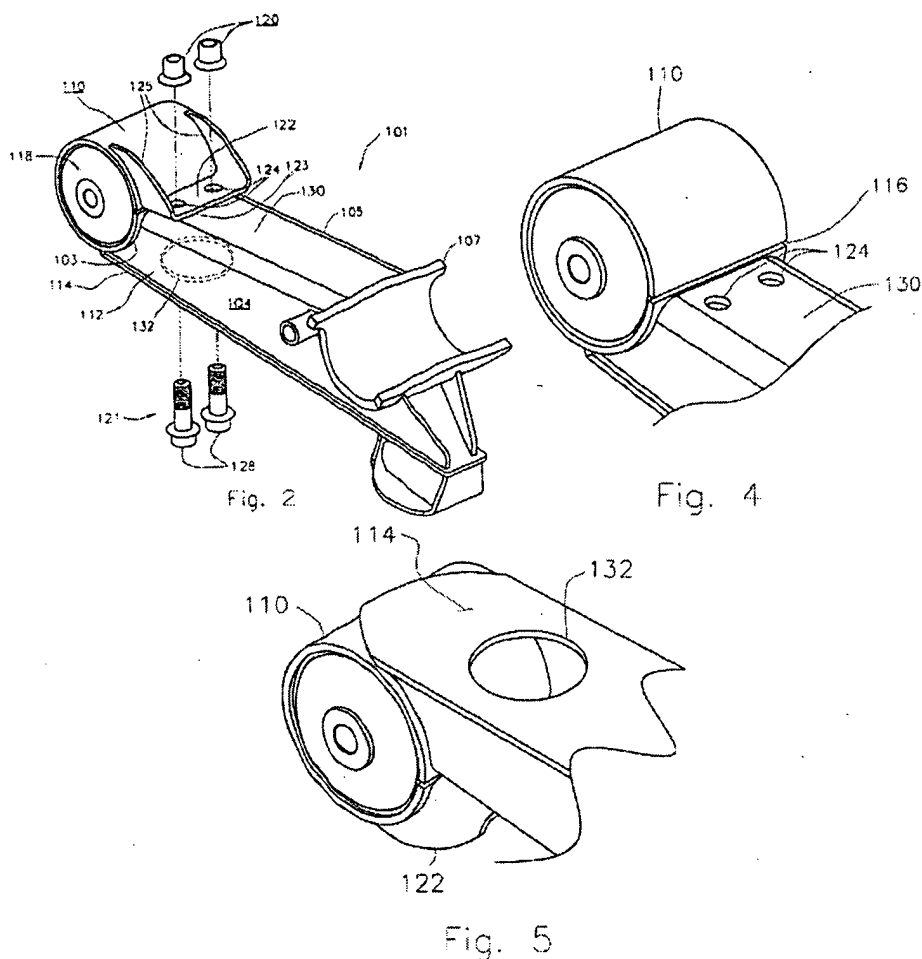
In the *Graham v. John Deere* opinion, the Supreme Court also explicitly warned against “slipping into use of hindsight” in obviousness determinations. *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966). Additionally, in the more recent case of *KSR v. Teleflex*, the Supreme Court has reiterated that an invention’s merit is not to be evaluated from a perspective of a person having the benefit of already knowing the solution conceived by the inventor, but rather as it would have been perceived by a person having only ordinary skill in the pertinent art. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742-43 (2007).

In the present case, the person having ordinary skill in the art would likely have a bachelor’s degree in engineering or a related applied science field, and would likely have several years’ experience in designing suspension system components. Such a person would be aware of conventional trailing arm suspension systems.

Raidel describes a typical trailing arm suspension system of the type illustrated in FIG. 1 of the present application. Compare FIG. 1 of Raidel to FIG. 1 of the present application. They are very similar.

The present applicants do not claim to have invented the trailing arm suspension system. Such suspension systems have been known for perhaps a century. Instead, the present applicants have described and claimed unique ways of constructing a suspension system with a composite beam, so that the problems associated with using a composite beam in a suspension system are solved.

At this point, it is instructive to note that Raidel does not describe a suspension beam having an I-shaped cross-section. FIGS. 2, 4 & 5 of Raidel are reproduced below:



As can be clearly seen in these figures, the Raidel suspension arm is made up of a U-shaped beam member 130 with a top plate 114, thereby forming a rectangular box-shaped cross-section (not an I-shaped cross-section). The top plate 114 can also be left off, thereby forming a U-shaped cross-section (also not an I-shaped cross-section). This is exactly how Raidel describes the suspension arm (see col. 3, lines 19-25).

Raidel discloses a metal control arm that includes a pivot bushing clamp assembly to facilitate retention and replacement of a hyperelastic pivot bushing. According to Raidel, the control arm can have various cross-sectional shapes, such as a closed cross-section (e.g., circular or boxed), or an open cross-section such as a U-shape (col. 3, l. 19). Raidel does not teach or suggest that the suspension beam could have a generally I-shaped cross section or that it could be made of a composite material.

Obeshaw describes a crushable structural member made of a composite material. A crushable structural member may be useful, for example, in a steering column (see FIG. 21 and col. 8 lines 38-49), so that the steering column collapses, instead of piercing a driver's body, when a vehicle has a front-end collision. For this purpose, the structural member includes an initiator which causes the member to crush at the location of the initiator (col. 2, lines 14-17).

Obeshaw discloses various composite constructions that may be suitable as a part or component in a vehicle. Obeshaw also discloses that at least one structural component, such as a bracket, coupler, cap, or the like, could be incorporated into a structure to make various vehicular parts (col. 8, ll. 13-36). However, Obeshaw also discloses that, "Primarily, the structural member can be used whenever a lightweight, strong, cylindrical object is required" (col. 18, l. 7). Obeshaw does not teach or suggest how to fabricate a reliable suspension control arm using a generally I-shaped composite material.

Wallace discloses a lightweight trailing arm suspension. The suspension includes a trailing arm with a frame bracket on one end and an air spring cup on the other end. Rubber bushed couplings for mounting an axle are provided midway between the ends of the trailing arm. Wallace discloses that the trailing arm comprises a forged I-beam portion with several longitudinal openings (at col. 3, line 67).

The differences between the claimed invention and the cited references are substantial. Raidel specifically teaches that, while the control arm can have various cross-sectional shapes, a closed cross-section is preferred (col. 3, ll. 19-25). Therefore, Raidel is telling the reader that, after having evaluated multiple cross-sectional options for the control arm, a closed cross-section (e.g. circular or boxed) is best. Therefore, a person of ordinary skill in the art would have no motivation after consulting Raidel to turn to the suspension of Wallace for further instructions regarding the cross-sectional shape of the control arm.

The Office Action suggests that the motivation to combine Raidel and Wallace would be to provide less weight in the suspension system, which produces a lighter vehicle. However, there is no reason to believe that the forged trailing arm disclosed by

Wallace in November of 1987 would provide any weight savings over the control arm of Raidel, which was disclosed in August of 2002. In fact, Raidel clearly states that his control arm would desirably provide a cost and weight savings over current designs (col. 1, ll. 42-44). Therefore, not only is there no evidence whatsoever to support the suggestion made in the Office Action, there is evidence in the Raidel reference itself that the suggestion made in the Office Action is untrue.

Additionally, the composite shapes taught by Obeshaw are hollow shapes with triangular, rectangular, hexagonal, octagonal, polygonal, elliptical, and circular cross-sections (col. 9, l. 66-col. 10, l. 45). A person of ordinary skill in the art, with the teachings of Raidel and Obeshaw in hand, would be motivated to design a composite control arm with a closed cross-sectional shape, not a control arm having a generally I-shaped cross-section as recited in claim 1 or having a cross-section with at least two flanges and a generally vertical web extending between the flanges as recited in claim 29. This is at least in part because both Raidel and Obeshaw teach directly away from using the I-beam shape of Wallace.

The Board of Patent Appeals and Interferences recently addressed this issue in *Ex Parte Whalen II* (Appeal 2007-4423, July 23, 2008) as follows:

The U.S. Supreme Court recently held that rigid and mandatory application of the “teaching-suggestion-motivation,” or TSM, test is incompatible with its precedents. *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). The Court did not, however, discard the TSM test completely; it noted that its precedents show that an invention “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.*

The Court held that the TSM test must be applied flexibly, and take into account a number of factors “in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 1740-41. Despite this flexibility, however, the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the way the claimed new invention does.” *Id.* “To facilitate review, this analysis should be made explicit.” *Id.*

[W]hen the prior art teaches away from the claimed solution as presented here . . . obviousness cannot be proven merely by showing that a known composition could have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in

the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition.

In the present case, no convincing reasoning has been presented as to why a person skilled in the art would have been motivated to make the invention recited in the claims. Instead, the cited references teach away from the claimed invention, and teach away from their combination with each other. Accordingly, a person skilled in the art at the time the invention was made would not have found it obvious to produce the recited invention from the teachings of the Raidel, Obeshaw and Wallace references, and withdrawal of the rejections of claims 1 and 29, and their dependents, is respectfully requested.

Furthermore, Raidel also does not describe how a metal end connection could be incorporated into a composite beam body as recited in claim 1. These deficiencies in the Raidel reference are not cured at all by combining it with the Obeshaw reference. Obeshaw merely describes a crushable composite structure (unsuitable, it appears, for constructing a suspension arm). These deficiencies are also not cured by the addition of the Wallace reference. For this additional reason, withdrawal of the rejections of claim 1 and its dependents is respectfully requested.

In view of the foregoing amendment and remarks, all of the claims pending in this application are now seen to be in a condition for allowance. A Notice of Allowance of claims 1-9, 12-46 and 48-53 is therefore earnestly solicited.

The examiner is hereby requested to telephone the undersigned attorney of record at (972) 516-0030 if such would expedite the prosecution of the application.

Respectfully submitted,

SMITH IP SERVICES, P.C.

/Marlin R. Smith/

Marlin R. Smith
Attorney for Applicant(s)
Registration No. 38,310

Dated: July 26, 2009

P.O. Box 997
Rockwall, Texas 75087
(972) 516-0030 (phone)
(972) 516-0608 (fax)

I hereby certify that this correspondence is being
filed in the U.S. Patent and Trademark Office
electronically via EFS-Web, on July 26, 2009.

/Sally Ann Smith/

Sally Ann Smith